Question Number	Scheme	Notes	Marks
1	$f(x) = x^3 + 4x - 6$		
1(i)(a)	$f(1) = -1$ $f(1.5) = 3.375 \left(= \frac{27}{8}\right)$	Attempts to evaluate at both end points. If substitution not seen accept $f(1) = -1$ **or** $f(1.5) = 3.375$ as evidence, with any value for the other end.	M1
	Sign change and $f(x)$ continuous therefore α is between $x = 1$ and $x = 1.5$	$f(1) = -1$ **and** $f(1.5) = 3.375$ both correct and mentions/indicates sign change, continuous and conclusion.	A1
			(2)
1(i)(b)	$f'(x) = 3x^2 + 4$	Correct derivative. Can be implied by a correct expression seen later such as $3(1.5)^2+4$	B1
	$x_2 = 1.5 - \frac{f(1.5)}{f'(1.5)} = 1.5 - \frac{3.375}{10.75}$	Attempt Newton-Raphson using the **correct** formula.	M1
	$x_2 = 1.186...$	Accurate first application either awrt 1.186, $\frac{51}{43}$ or a correct numerical expression.	A1
	$x_3 = \left(1.186... - \frac{0.412...}{8.220...}\right) = 1.1358...$		
	$\alpha \approx 1.136$	cao	A1
			(4)
1(ii)	$g(1.4) = 3.442116...$ **or** $g(1.5) = -3.601419...$	Evidence of at least one value correct to 3 d.p. or better. May be implied by correct answer if never seen.	B1
	$\frac{1.5-\beta}{\beta-1.4} = \frac{0-g(1.5)}{g(1.4)-0}$ or $\frac{\beta-1.4}{0-g(1.4)} = \frac{1.5-1.4}{g(1.5)-g(1.4)}$ oe	A correct linear interpolation statement as shown oe (with correct signs). May omit the zeroes or use evaluated values (e.g 0.1 instead of 1.5 – 1.4). Other forms are possible.	B1
	$\Rightarrow \beta \approx 1.448869...$	Evaluates β from an attempt at a linear interpolation statement, allow if signs are incorrect. $\beta \approx$ awrt 1.449	M1 A1
			(4)
			Total 10